

PMC Marine

Maritime Auditing

Risk Assessments

Consultancy

Navigation Impact Assessment for the Proposed Ferry terminal facilities adjacent to No.80 Greencastle Pier Road, to allow operation of a Vehicular Ferry across Carlingford Lough to Greenore, Co Louth.

Prepared on Behalf of Frazer Ferries Ltd

Issued : February 2015



Contents

1. Introduction

- Overview
- Background

2. Navigation

3. The Proposed Construction

4. Possible Impacts during Construction phase

5. Possible Impacts during Operational Phase

6. Mitigating Measures

- Construction phase
- Operations phase

7. Assessment Conclusions

8. Annex 1 - 4

9. References/Abbreviations

Introduction

Overview

As part of the Marine License Application Stage for the Carlingford Ferries Project, the requirement for an assessment into the Impact on Navigation during the Construction and Operational phases has been highlighted. This Assessment (hereafter referred to as the Navigational Impact assessment, or NIA) shall consider the possible impacts which can be reasonably predicted, towards the Navigation of other vessels near the area of the proposed construction site. The proposed site is to be situated adjacent to 80 Greencastle Pier Road, and will extend offshore to a distance of approximately 64M from the MLWS Mark. At this current Location there are presently 4 moorings close in the vicinity, which are used as seasonal anchorages for pleasure boats and a day trip fishing boat. However, these moorings could be easily accommodated in a different location with agreement from the third parties. There is no known record of official mooring points at Greencastle from the Crown estate point of view, however traditionally moorings have just been deployed by vessel owners for over 30 years.

The Main areas for consideration during this assessment are:

- Impact on Navigation in surrounding area during construction Phase
- Impact on Navigation in surrounding area during Operation of Ferry
- Possible Impact on Seabed and Tidal Currents during Construction
- Identification of Navigation Hazards which are imposed by new construction, for the surrounding area
- Identification of Navigational Hazards which are likely to affect operation of Ferry and/or Operating Route

This Assessment shall identify only predicted possible impacts towards Navigation during the two phases, and shall be based upon conclusions taken from:

1. Historical information regarding vessel traffic in Surrounding Area, and Density of moored vessels during peak periods of the year. (Including Shipping Traffic for purposes of tracking Pilot Boat movements from Greencastle)
2. Local Knowledge taken from Consultation with Carlingford Lough Pilots
3. Professional Judgement, Desktop Research, Aerial Photography, Navigation chart BA 2800, Distances measured via satellite imagery and Google Earth, Photo Montages and Images showing proposed development and Plans.

Background

Greencastle, Co Down is a small Coastal Hamlet on the North Eastern Shores of Carlingford Lough, and has access to a Natural deep channel at its doorstep. For many Decades Greencastle has been a

popular location for many vessels all throughout the year, both Commercial and domestic. These vessels moor in the deep water beyond the MLWS Mark which is known as "the channel". However, this is not a designated shipping channel, and the moorings extend out as far as the Proposed ferry Landing site, then from this point outwards the channel is left open for safe navigation. Navigation between the Current Moorings has always been carried out with local knowledge safely. The closest Navigational Hazard from the most outward moorings (which is the proposed location of the Ferry Slipway construction) lies to the south, by approximately 98 Meters away at MLWS. (See Annex 1)

The Channel which runs through Greencastle Gradually Narrows and becomes shallow towards the Northern side of Green Island, and sand banks which are reported to be slowly moving further North Westward every year lie to the west and North of this point. (See Chart Image for charted shoals, Annex 2). After consultation with Carlingford Lough Pilots, It has been agreed that the banks and Rocks, as well as proximity of Moorings in this area make it hazardous for the ferry passage, and the channel on the Eastern approaches to Greencastle is the safest option, as there is a wider channel and no current moorings beyond this point. The Channel on the Eastern approaches to Greencastle has a minimum width at MLWS of approximately 80M, and Minimum depth between 3-4M. Further out from Greencastle, outside the area of this assessment, lies a shoal of around 2.6m. This Eastern Channel is the one most often used for approaching Greencastle.

Navigation

Greencastle is the Base for Carlingford Lough Pilots, who Currently operate two Pilot Launches, Two tugs, One workboat and two Tenders. The Pilot boats are regularly moving throughout the day and night, on a 24/7 basis, while covering the pilotage operations for Carlingford Lough.¹ Normally only one Pilot Launch is in operation at a time. The Tugs are moored at Greencastle, close to the Proposed Ferry site. The closest tug to the Proposed site is moored approximately 130 Meters away. These tugs mostly use the Eastern Channel When departing or Arriving at Greencastle, but are not confined to such, as given appropriate tidal conditions they can navigate safely through the Western Channel due to their local knowledge. The Maximum breadth of the Largest Tug is 7M, and Has a Maximum Draft of 3M.

The Carlingford Lough Commissioners also operate a Commercial Vessel from Greencastle, which is tasked with the duty of maintaining the navigation marks and Buoys on Carlingford Lough.² This Vessel is moored in a private berth on the Western side of Greencastle, which dries out at Low water. The vessel normally operates during normal office hours (8-5) and can only depart the berth about two and a half hours before/after High Water; which gives a 5 hour window on each Tide for operations. If the Berth is not accessible then the Vessel will usually Berth at Warrenpoint, or Tie up alongside one of the Tugs while waiting for water. This Vessel will use both the Western and Eastern

¹ Pilotage acts in Carlingford Lough have significantly Increased, from 234 ships in 2011 to 544 ships recorded in December 2014.

² There are 26 Navigation Buoys on Carlingford Lough, all serviced annually, and maintained when necessary by the CLC Tender, as well as several Day Marks on the Lough, and Navigation Buoys in the Narrow water River beyond Warrenpoint. Other Navigation Marks on Carlingford Lough remain the responsibility of the Commissioners of Irish Lights.

Channels, depending on where it is bound for. The vessel is regularly used for Harbour maintenance and miscellaneous work in Warrenpoint Port throughout the year also.

There are Several Seasonal Fishing boats which operate out of Greencastle, between the months of May - October. One of these Boats is a Charter Day Angling Vessel, which is kept moored Close in the Vicinity of the Proposed Ferry Landing Site,(within 30M). This Vessels Mooring would need to be Re-Accommodated if Possible, upon agreement with the Vessels owner and the Ferry Operator. The Remaining Fishing Boats are Moored closer to the Vicinity of the Existing Pier at Greencastle, and clear of the Proposed site. There are also several Pleasure Vessels which Moor during the Summer Season on the Eastern side of Greencastle, two or three of these Vessels Moorings lie approximately within a 100M Radius of the Proposed Site, and may require re-accommodating as well. The owners of the Fishing boats use Tenders which are kept on the Beach above the High water mark, and most of these Tenders are Kept on the Eastern side of the Existing pier, approximately 190 - 210 Meters away from where the Proposed Construction site would be. The Majority of Fishing Vessels use the Eastern Channel, as they Fish mainly on the Outer stretches of Carlingford Lough, and near the Coast.

The Closest Public Access to the Beach at Greencastle is on The Western Side of the Existing Pier, and is approximately 315 Meters away from the Proposed Site³. This access is even somewhat restricted for public use, but public users such as swimmers, Kayakers and Beach Fishermen normally make use of the access point regardless. There are other access points to the Beach which are closer to the Proposed Site, however these are Private and only available to a small number of users, as they pass through private properties. There is a Beach side Property adjacent to the Proposed Site, which is 88 Greencastle Pier Road, and this property has use of a small vessel which is moored off shore close to where the Proposed Construction would be; and the owners of this property also make use of a sailing dinghy and small tender during the summer season. These are kept at the front of the property, which has direct access to the Beach. During the Summer season, Greencastle attracts some Diving Clubs, and divers will occasionally dive around the Existing Pier structure, and close by Rocks/Moorings, using access from the Beach. There are no Known diving attractions in the Vicinity close to the Proposed Ferry Site at the time of making this Assessment, and Divers are not expected to be Impacted.

During the period from October - April ("off season"), Greencastle's waters have Normally been used only by The Commercial Vessels, some of which move frequently during periods of strong winds to Warrenpoint Port, for shelter. There are not normally any Visiting vessels during the Off Season, as most Pleasure craft are taken out of the water, or moored in Carlingford Marina, or Warrenpoint Town Docks Marina. However, there are occasionally Visiting Yachts which Moor overnight in Greencastle, during the Summer Season. Greencastle has even been Host to a small Square Rigged Tall Ship, which anchored in the Channel overnight. This Vessel had a Length of 45m Overall, a Breadth of 7m, and Draft of 3.95m. The Vessel Anchored in the position where one of the Tugs normally Moor, which as stated before lies approximately 130m from the proposed ferry site. This Vessel is a lot less Manoeuvrable, and carries a lot more Windage area than a typical cross channel ferry; and was able to safely Navigate through the Approach channel and manoeuvre clear of all other vessels in the area without difficulty. The Tall ship was under command by one of the

³ Reference Taken from Google Earth Measurement.

Local Pilots, and proved that a vessel of 45m LOA can safely navigate and manoeuvre in Greencastle with appropriate Local knowledge and experience.

Typical Cross Channel Ferry : (LxBxD) 45/50M x 14M x 1.6M



Tall Ship Pelican: (LxBxD) 45M x 7M x 3.95M



The Proposed Construction

The Proposed Construction for the Ferry Landing site will consist of a Reinforced suspended Concrete Pier on 508mm Dia. Tubular Piles (58m Length) connecting to a Reinforced suspended Concrete Slipway on 508mm Dia. Tubular Piles (70m Length). This Slipway will have a slope gradient of 1:9, and 64m of such will be what extends beyond the MLWS mark. There will be 12 Vertical Tubular docking/landing piles on the Eastern end of the Slipway, extending a further 25m outwards (total 89m from MLWS mark) fitted with Fender panels and Mooring Bollards. The Pier and Slipway will be constructed so as to maintain the natural water flow beneath the surface, and will have

minimal impact on the natural currents in the area. There will also be access through the pier from the beach. The Construction when erected, should provide a little shelter in the vicinity, during south easterly winds, particularly with the ferry docked. When Docked overnight, the Proposed ferry will overhang the last Docking Pile by about 20M. When Docked overnight; the distance between the Ferry and closest Navigational Hazard (Rock as shown in annex 1) will be approximately 98M, and this is deemed sufficient for safe navigation.⁴ The Last Docking Pile is Proposed to have a Navigation Light Fitted.⁵ This Navigation Light will be erected on a Pole at a height of 5.3m above high water, and will be the responsibility of the Ferry Operators to Maintain. There will be an Emergency Access Ladder on the Front Docking Pile, for retrieval of a person from the water in Emergency. The Proposed Construction when Erected is not expected to interfere with Navigation of other Vessels, and the construction itself will become a useful land reference for navigating into Greencastle from the Eastern approach Channel. Visibility of the Approach channel by small Boat users may be somewhat obscured when the Ferry is docked, but vessels passing the ferry will be doing so at slow speed and with caution. The Height of the Pier above MHWS Sea Level will be 3m, and at MLWS will be 7m.⁶

Possible Impacts During Construction Phase

Considering the planning process, in particular the application for planning permission for the Proposed structure; there have been a few concerns raised by the Loughs agency for Carlingford Lough. These Issues relate to the Possible Impacts during the operational Processes of the Ferry Project, and highlight concerns of Increased Noise and Vibration, Increased risk of Pollution in the area, and Possible Changes in the sedimentation of the water, due to changes in the water flow as a result of the New structure which has been proposed. These Issues have been addressed during the consultation processes, and are included in the Developers Environmental Impact assessment.⁷

As stated in the EIA and above; (Ref section 7.3.4.1) " The Project has been designed to require Minimal site disturbance at each Ferry Terminal (Greenore and Greencastle), and to utilise Natural Seabed Depths at each location. Potential effects considered during the construction phase are mainly associated with the release of sediments during site excavations and piling, noise generated during piling, and the possible release of pollutants into the aquatic environment."

During the construction phase, for the Piling Process and under water works there will be a Barge platform and associated Pile driving machinery at the site at Greencastle, and a designated safety work boat. There will also be stages during the construction where Divers are required for under water construction and surveys of the structure. The developers are considering the use of a Jack up Barge for the construction process, as this type of barge takes up a smaller area, and is made secure on the seabed without outlaying anchors posing underwater obstructions. The Barge would be manned during normal daylight working hours, and remain lit up at night, and taken inside of

⁴ It is Recommended for Safe Navigation of the Ferry, and for other Vessels after construction is erected that this Rock is sufficiently Marked (see Annex 3 for Proposed Navigation Marks).

⁵ The exact characteristics of which are yet to be decided, and given Statutory sanction by Commissioners of Irish Lights.

⁶ Based on Average Tidal Range at Greencastle to be 4m Maximum.

⁷ The EIA and planning process can be viewed publically through www.planningni.gov.uk/publicaccess (Application Ref P/2013/0434/F)

the proposed construction limit after hours. The approximate time frame for the Piling process is expected to be around 14 weeks (weather permitting) from the onset of the construction phase, and it is expected that there will be restrictions imposed which do not permit the Piling process to start before the summer season ends. Construction during the "off season" would mean that Navigational impact would be minimised to the Commercial vessels operating out of Greencastle. Carlingford Lough Pilots have the largest quantity of these vessels which would be impacted, and after consultation they are of the opinion that their operations will not be significantly impacted, as there will remain a safe distance between the end of the proposed structure and the closest Navigational hazard.

Stages during the construction whereby Divers are operating under water will need to be considered, and appropriate risk assessments made by the diving contractors prior to the operations. From a Navigational point of View, there is a safe amount of water for the diving to continue without adversely affecting navigation in the area. The Diving contractors will have a safety Boat, will listen on VHF Ch 12 and 16, and will be displaying the International Code Flag "Alpha". Any Traffic approaching Greencastle or Departing a Mooring will be expected to pass the area at slow speed and with caution⁸. There should be no requirement for restrictions to be placed on the navigation of vessels, considering these control measures to be in place.

As per statements in the Developers EIA, there will be no Dredging associated with the construction of the proposed structure, and the slipway/Pier will be conceived in such a way as to minimise disturbance to the local water flows (pre and Post construction). The only sediment released during the Construction phase will be that which is displaced by the Piling process, which is not considered a great amount. From a Navigational Impact perspective this is a positive, as there will be minimal, if any changes to the Tidal currents, and a build up of silt in the area is not considered likely, maintaining natural depths at Greencastle and approaches. As stated previously in this Assessment, the proposed new structure may also create some level of additional shelter to the vicinity, during periods of South Easterly Winds.

Possible Navigational Impacts Post Construction and during Operating Phase

During the Operation of the Proposed Ferry, the Navigation of other Vessels and safety of other recreational users in the area has been considered. The Proposed Location of the Ferry Landing site allows for a safe distance between existing Navigational Hazards and the Navigable channel, and will not cause the need for other vessels to steam any additional distance to approach or depart Greencastle. The Operations of the ferry should not adversely affect the Navigation of other vessels in the Greencastle area, however the following situations have been considered a possibility (Including worst case scenarios):

- Manoeuvring of the Ferry on and off the slipway, and the need for vigilance and keeping a good look out for vessels manoeuvring close in the area.
- Passing of the ferry and another vessel at the narrowest section of the channel. The narrowest section of the navigable channel at Greencastle is approximately 80M wide, with a depth of around 3 - 4m at MLWS (See annex 4: chart extract). Considering the breadth and Draft of the proposed ferry being 14m x 1.6m, and the max breadth and depth of the largest

⁸ Vessels passing the Construction shall be expected to pass at slow speed, and at a reasonable safe Distance off. However, it must also be considered the possibility of vessels not passing at slow speed.

vessel currently operating out of Greencastle being 7m x3m this leaves sufficient availability for safe passing at this point if necessary.

- Vessels in the vicinity Dragging anchor and/or breaking free from moorings, resulting in collision with ferry or structure.
- Collision between Ferry and Yacht, Fishing vessel, other Commercial Vessel, Recreational craft or other water users.
- Local fishing vessels having Pots deployed close to the Ferry Route
- Pollution incident caused by the operation of the ferry, or caused by vehicle being carried on the ferry.
- Possibility of Navigational constraints imposed in the Greencastle approaches during periods of Restricted Visibility (However, proposed structure will assist Navigation by Radar in such cases).
- Breakdown of ferry resulting in stranding in the approaches to Greencastle, creating a Navigational Hazard, or collision with another vessel.
- Interaction between Ferry and smaller vessel(s) when passing close by in Greencastle Approaches.
- Ferry Breaking free from overnight Moorings and colliding with other vessel.

A Detailed Navigational Safety Risk Assessment for the Ferry operations shall be included in the operational/Health and safety Manual (section 2.9.4), and will highlight all identified Navigational risks from the Ferry's perspective, including Control measures for such risks. Some of the above considerations are also included in this Risk assessment.

Predominantly throughout the Year, winds in the Greencastle area are from a Westerly/North Westerly Direction, which makes Navigation and Manoeuvring in the area rather exposed to the elements, due to lack of shelter. It is expected that during times of Strong West or North West winds, the operations of the ferry at Greencastle may be disturbed. South Easterly winds can also make manoeuvring and Navigation difficult in Greencastle, particularly for the ferry during loading/discharge operations. However, the proposed structure would provide some shelter from this wind. It is a possibility that the Ferry would be keeping itself on the slipway by use of her engines during moderate South Easterly Winds, and during periods of strong winds the operation of the Ferry may also be disturbed.

Mitigating Measures against Navigational Impacts

Construction Phase:

- Jack up Barge to be used for construction process, instead of a conventional anchor barge.
- Barge to be moved clear of channel during unmanned hours, and Barge to remain lit up at night time.
- Barge to maintain VHF Listening watch during working hours.
- Barge to display sign requesting Slow speed when passing, and contact details.
- Work permit system and risk assessments in place for diving and any other over side work carried out. Divers shall display International Code flag "Alpha" during diving operations, and keep a listening watch on VHF.
- Safety boat will be available during working hours.

- Local Notice to Mariners shall be issued by Carlingford Lough Commissioners to cover all aspects of the construction phase. UK Hydrographic office to issue Temporary/Preliminary NTMs for construction process. Other appropriate forms of Media will also be used to inform the Public of the construction process.. NTM's to request safe passing distance from construction, and slow speed.
- Re Accommodating of existing Moorings which are close to the proposed structure, with agreement and cooperation from owners of moorings.
- Marking the new structure and aids to Navigation on the appropriate Navigation Charts, through promulgation of Permanent NTM through Hydrographic office.

Operational Phase:

- Alternative Mooring arrangements available for layover period of ferry will be arranged, for periods of unfavourable weather.
- Proposal of three Aids to Navigation in total, to be made to and sanctioned by Commissioners of Irish Lights (See Annex 3 for Proposed Nav Aids).
- Ferry shall be Manned with appropriately qualified and trained personnel, and the International Regulations for Preventing Collisions at Sea 1972 (as amended) shall be adhered to whilst the vessel is underway at all times.
- Meeting or passing vessels in the approaches to Greencastle shall be carried out at slow speed, and with due regard to any special circumstances which may be involved.
- Local knowledge and experience will be sufficient to enable the ferry to remain in safe water whilst passing fishing gear, and fishing vessels attending gear. The proposed Passage plan will take into consideration local fishing hot spots and plan a route which passes clear.
- Ferry operations/safety Manual will state clearly any operating limitations/conditions imposed on the vessel (Including max sea state and minimum Visibility condition requirements).
- Use of engines during load/discharge shall be with due regard to other small vessels and water users close in the vicinity, and engines shall be immediately stopped if a hazard is likely to occur towards another vessel. Similarly it will be expected that other vessels and water users be aware of the likely effects of passing close to the ferry while using engines on berth. A 30m exclusion zone could be proposed.
- Ferry will be listening on VHF 12/16 and shall operate AIS equipment during operations. Passenger reports shall be sent to local authorities via agreed method from ship or shore.
- Co operation with Search and Rescue organisations and Authorities on both sides of the Border on Carlingford Lough.

Assessment Conclusions

Considering the Facts and information contained in this Assessment, the presence of the proposed construction and operation of a ferry will not significantly impact on the Navigation of other vessels

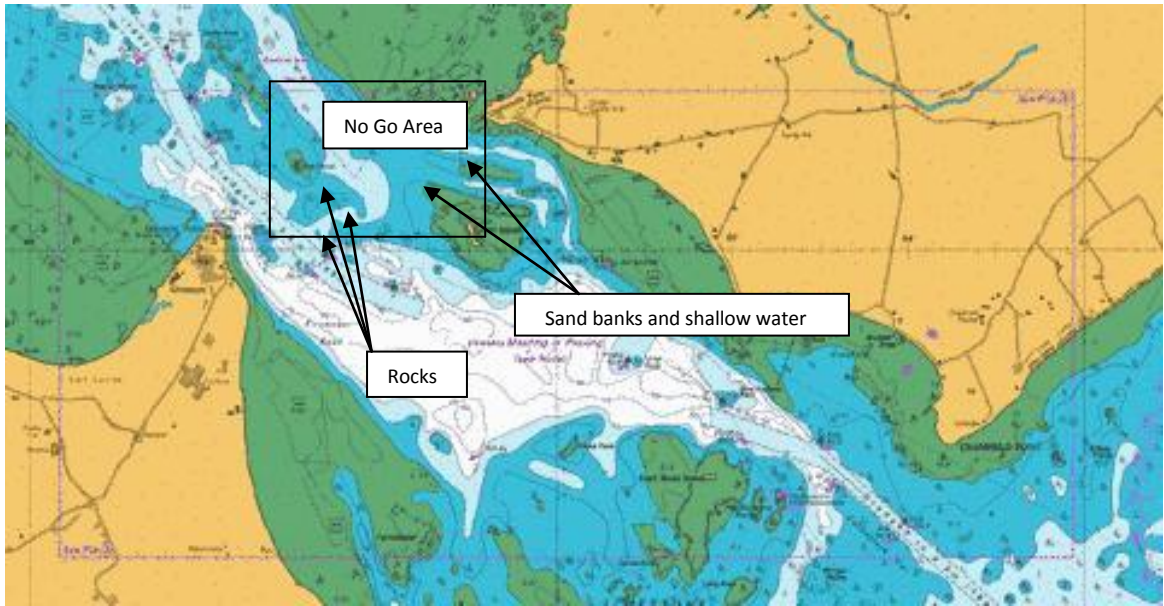
in the area. The Natural deep water at Greencastle will accommodate the Proposed structure with a safe margin of navigable water in the vicinity, considering the present concentrations of vessels kept in Greencastle, and their relatively small size. Co operation between Local vessels (Commercial, fishing and recreational) and the Ferry will be required at times, when circumstances admit. Effective Communication and Promulgation of safety Information will be Vital during the Construction stages, particularly when carrying out under water operations, and also during the operational stage. The construction of the Proposed project is considered also to have minimal impact towards Navigation, with the appropriate mitigating measures in place. As stated previously the Proposed construction will even aid Navigation into Greencastle, by serving as a land mark, and the proposed Aids to navigation which will be included with the construction will also further aid other vessels.

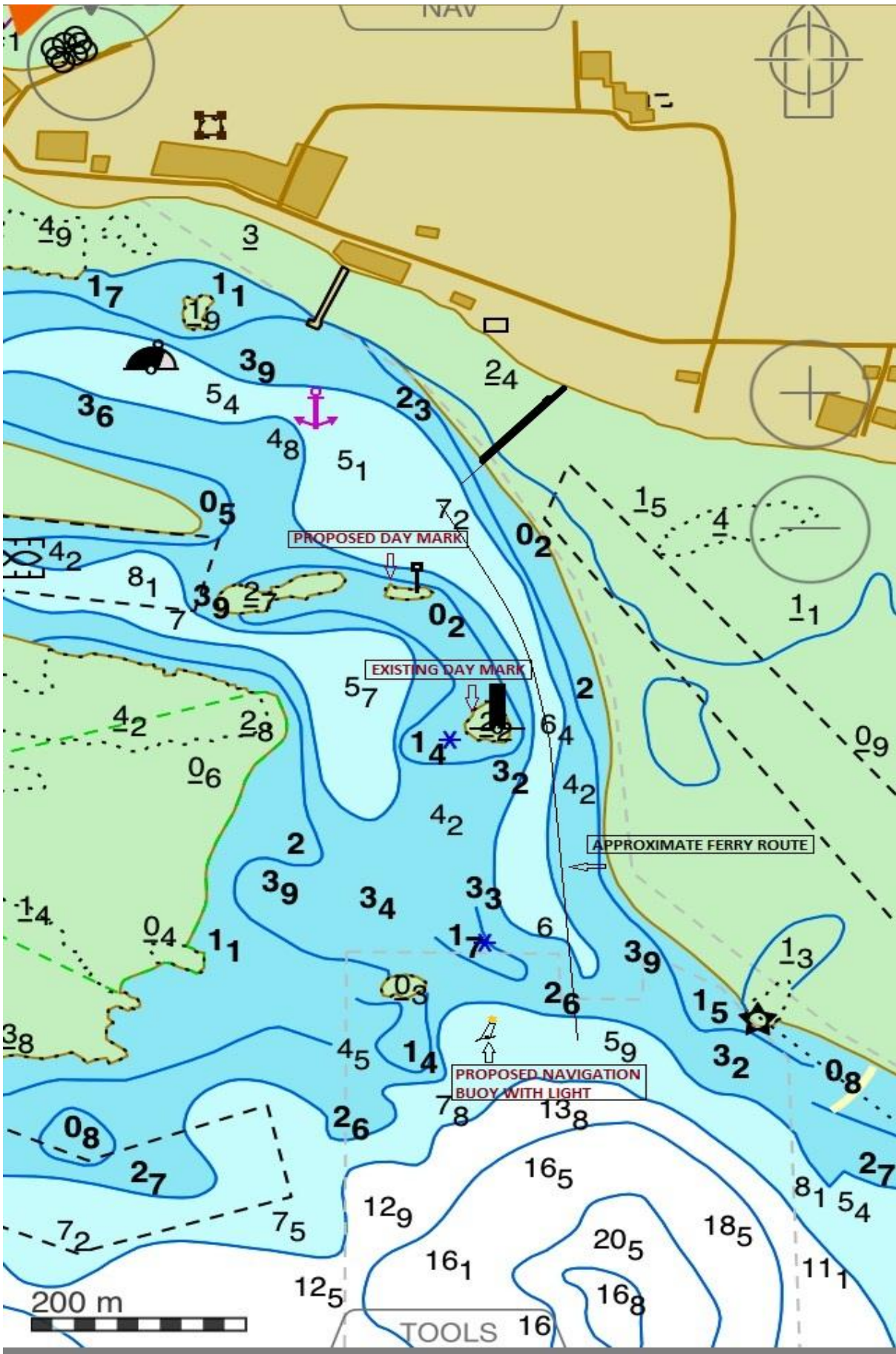
Considering the Construction stage will occur during the Winter period, there will be little concern for recreational users being affected. Operations of the ferry will remain safe, and impact towards Recreational users will be minimised, by effective Safety Management procedures adopted by the Ferry Operators. Local Fishing vessels similarly will not be impacted during Construction of the proposed structure, as they will be out of the water. The proposed Mitigating measures are deemed sufficient for scenarios involving fishing vessels and fishing gear.

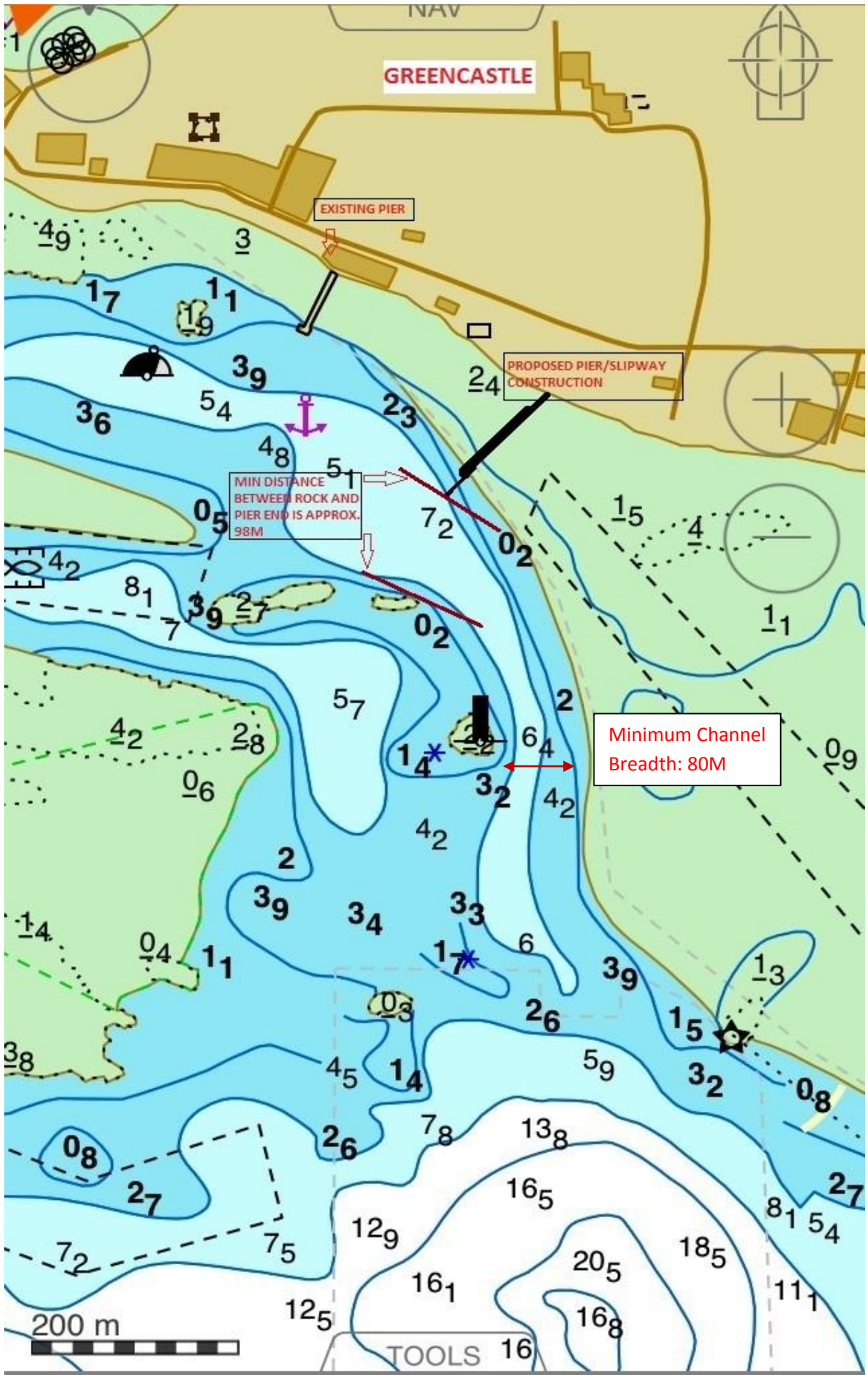
Annex 1: Proposed Pier with Ferry outline -
Satellite Image showing Distance from
Rocks.



Annex 2: Chart Extract







References

1. Google Earth - Used for Images and Measuring Distances .
2. MAIB (Marine Accident Investigation Branch) - used to search for related incidents involving commercial vessels, pleasure vessels and fishing vessels in Carlingford Lough (collisions, grounding, etc).
3. www.planningni.gov.uk - used for research into proposed development, and related documentation such as EIA.
4. www.loughfoyleferry.com - used for research on similar vessel types and operations
5. www.greencastlecodown.org/protect-and-conservation - used to research local views and concerns on project. Concerns such as coastal erosion which developers have shown in EIA will not be an issue, and safety at sea. The safety at sea opinion of the website is rather obscure, as the ferry will be manned by appropriately Qualified personnel, who will be trained with local knowledge.
6. www.cil.ie - used for information regarding sanctioning of new aids to navigation.
7. Various plans and images, and consultation supplied by RPS Consulting Engineers Ltd, the Consulting engineers for the proposed Development.
8. Consultation with Local Pilots.
9. Chart images from Annexs 3&4 taken from Transas Software (Screen shot)

Abbreviations

- MHWS - Mean High water Springs
- MLWS - Mean Low water Springs
- NIA - Navigation Impact Assessment
- EIA - Environmental Impact Assessment
- CLC - Carlingford Lough Commissioners (Local harbour authority for Carlingford Lough)
- CIL - Commissioners of Irish Lights (General Lighthouse authority for Ireland and Northern Ireland)
- LxBxD - Dimensions Length x Breadth x Draft

